# CPR Training for Teenagers

Group E

Edvin Jakobsson, Jenny Chim, Stella Chytiroglou, & Yao Lu

16/03/2018

# Cardiopulmonary Resuscitation (CPR) and use of Automated External Difibrillator (AED) in a **Virtual Reality Environment**

**Target Users:** Elementary school children     **Context:** Classroom     **Aid:** Normal Teacher

**Theoretical Framework:** ERC guidelines stress the importance of following **ALL STEPS** in the **RIGHT ORDER.**

**Goal:** Train the children in **CPR** & **Stress Management**

Dummy: Pressure Sensors                 Hypothetical Scenarios

Eye-tracking                               → Adapted to the location (Edinburgh city)

Voice Recognition                     → Increasingly more complex/Stressful

Gloves: Heart rate sensors

Virtual Agent: 1st Aid Responder → Instructions during initial stages
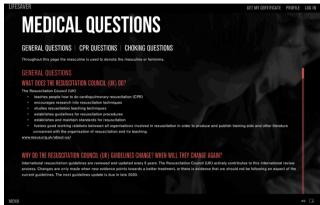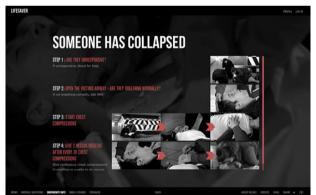
Comments during performance of task

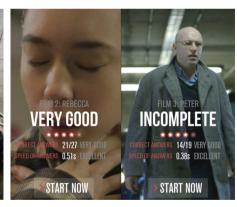& Personalised Feedback for Student and Teacher

# The Program

- Informative Video
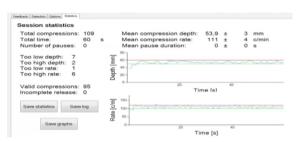- Presentation of steps + Drilling
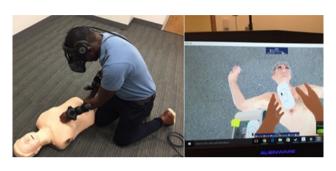- Practice in VR using dummy

http://www.life-saver.org.uk/

VREM (https://www.indiegogo.com/projects/mini-vrem)
Semeraro et al., 2013

TUTOR: Right.
TUTOR: After calling 911, what do you do?
STUDENT: 🎤 I check for >>

**Cognitive Tutor** (Anderson et al., 1987; Aleven and Koedinger, 2002)
- CPR training ~ strict steps
- Production rules for procedural + declarative
- Focus on each action rather than presenting facts → minimise cognitive load
- Immediate feedback

**Autotutor** (Graesser et al., 2004)
- Dialogue with tutorial agent
  - Early stages: talk through situation
  - Based on student model: feedback, hints, prompts, assertions, summaries...etc
- Adapt scaffold size to progress

# Street Management

Tools: Gloves with Heart Rate Sensors to measure children's pulse to tell their stress levels

Purposes: test whether the children are suitable enough for CPR

Normal heart rate (bpm): 70 to 110 (from 7 to 9 years) ; 60 to 100 (over 10 years)

Practice two things:

- the skills of CPR
- better psychological quality

# References

https://cprguidelines.eu/

https://www.indiegogo.com/projects/mini-vrem

http://www.life-saver.org.uk/

https://www.medicalnewstoday.com/articles/235710.php

Aleven, V., and Koedinger K. (2002). An effective metacognitive strategy: learning by doing and explaining with a computer-based Cognitive Tutor. *Cognitive Science*, 26(2), 147-179.

Anderson, J. R., Boyle, C. F., Farrell, R., & Reiser, B. J. (1987). Cognitive principles in the design of computer tutors. In P. Morris (Ed.), *Modeling Cognition*, Wiley.

Graesser, A. C., Lu, S., Jackson, G. T., Mitchell, H. H., Ventura, M., Olney, A., & Louwerse, M. M. (2004). AutoTutor: A tutor with dialogue in natural language. *Behavior Research Methods, Instruments, & Computers, 36(2)*, 180-192.

Perkins,.OlasveengenIan, Maconochie, Soar, Wyllie, Greif, Lockey, Semerano, Van de Voorde, Lott, Monsieurs, Nolan on behalf of the European Resuscitation Council (2018). European Resuscitation Council Guidelines for Resuscitation: 2017 update. *Resuscitation, 123,* 43-50.

Semeraro, F., Frisoli, A., Loconsole, C., Bannò, F., Tammaro, G., Imbriaco, G., Cerchiari, E. L. (2013). Motion detection technology as a tool for cardiopulmonary resuscitation (CPR) quality training: A randomised crossover mannequin pilot study. *Resuscitation,* 84(4), 501-507.

# Thank you!